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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/671,873

09/29/2003

Gerald Harron

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10/31/2006

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CANADA

EXAMINER

ODOM, CURTIS B

ART UNIT

PAPER NUMBER

2611

DATE MAILED: 10/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/671,873	HARRON ET AL.	
	Examiner	Art Unit	
	Curtis B. Odom	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to because the axis of each graph should be labeled (see Figs 9-11). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 1 and 3-5 are objected to because of the following informalities:

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- a. In claim 1, line 12, the phrase “amplifying the signal” is suggested to be changed to “amplifying the composite signal”.
- b. In claim 1, line 7, the phrase “the same modulation” is suggested to be changed to “a same modulation”.
- c. In claim 3, lines 20-21, the phrase “delay in is performed at any point the” is suggested to be changed to “delay is performed at any point in a modulation process”.
- d. In claim 4, line 22, the phrase “delay in is” is suggested to be changed to “delay is”.
- e. In claim 5, line 1, the phrase “delay in is” is suggested to be changed to “delay is”.
- f. In claim 5, line 2, the phrase “the RF stage” is suggested to be changed to “a radio frequency (RF) stage”.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

- 3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vankka (US 2003/0206600) in view of Montojo et al. (US 2003/0202611).

Regarding claim 1, Vankka discloses method of generating a multi carrier quadrature amplitude modulation (QAM) signal (see Fig. 1, section 0004 and 0023) comprising:

creating (as described in section 0004) a plurality of four composite amplitude modulated QAM signals each using two carriers of the same local oscillator frequency wherein the two carriers are distinguished by having a phase shifted difference of 90 degrees;

wherein the QAM signals are of the same quadrature baseband modulation as shown in Fig. 1 (see also section 0004);

wherein the QAM signals have the similar local oscillator clocks (see section 0004), wherein the carrier branches are similar;

summing (at element 112 of Fig. 1) the QAM signals to form a composite multi carrier QAM signal (see section 0004; and

amplifying the QAM signals in power amplifiers (see Fig. 1, 111, section 0004) for transmission;

However, Vankka does not disclose the QAM signal are of the same data rate and phase, wherein there is provided a symbol delay on one or more QAM signals prior to the signals being summed where the delay is computed such that peak QAM power transitions in the QAM signals statistically do not align in time.

However Montojo et al. discloses a multi-carrier transmitter system (Fig. 5, block 500, section 0023), wherein the carriers are modulated in blocks 300A-C, wherein also the modulation performed is QAM, wherein the same data rate is used in used in each modulator (as

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described in section 0021) according to a receiving destination. The modulated carriers are summed (see Fig. 5 element 502), to produce a resulting signal (element 504) which is shown in Fig. 4. According to Fig. 4, each carrier (460, 461, 462) has the same phase and bandwidth. Montojo et al. also discloses there is provided a symbol delay (see Fig. 5, 512B-C) on two QAM signals prior to the signals being summed, where the delay is computed based on a chip time (see section 0023) or a symbol time (see section 0028) such that the peak to average power ratio is reduced (see sections 0003 and 0013) since the peak values of each symbol are not aligned in time because of the delay. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the multi-carrier QAM modulation method of Vankka with the delaying of Montojo et al. since Montojo et al. states the delaying of the carriers reduces peak to average power ratios (see section 0003).

Regarding claim 2, Montojo et al. further discloses the delay is arranged according to the equation: the additional delay for each QAM signal is equal to the symbol rate (duration) of the QAM signals divided by the number of QAM signals in summation (see section 0028), wherein each addition delay is $\frac{1}{3}$ the symbol time or the symbol time divided by the number of signals (carriers), which is 3 in this case. It would have been obvious to include this feature since Montojo et al. states the delaying of the carriers reduces peak to average power ratios (see section 0003).

Regarding claim 4, Montojo et al. discloses the delay is performed immediately prior to summation of the QAM signals (see Fig. 5, elements 512B-C). It would have been obvious to include this feature since Montojo et al. states the delaying of the carriers reduces peak to average power ratios (see section 0003).

Regarding claim 6, Montojo et al. further discloses the carriers of the QAM signals are of equal level (see Fig. 4, carriers 461, 462, and 463). It would have been obvious to include this feature since Montojo et al. states the delaying of these carriers reduces peak to average power ratios (see section 0003).

5. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vankka (US 2003/0206600) in view of Montojo et al. (US 2003/0202611) as applied to claim 1, and in further view of Keashly et al. (U. S. Patent No. 6, 330, 289).

Regarding claims 3 and 5, Vankka and Montojo et al. do not disclose the delay is performed at any point in the modulation process of the QAM signal or the delay is performed in an RF stage of the composite QAM signal.

However, Keashly et al. also discloses a multi-channel (carrier) system including multiple channels (carriers) upconverted to an RF frequency and then combined for transmission (see column 4, lines 6-16). Time delays/offsets are introduced (see Fig. 5) in each radio frequency channel to prevent the signal peaks of each carrier (channel) from occurring at the same time to reduce peak power (see column 2, lines 27-39). The delays can be introduced at the beginning of a carrier modulation process (see column 5, lines 47-59) to produce a delayed bit stream for carrier modulation. Keashly et al. further discloses the time delay offsets can be introduced at any point prior to combining the channels (carriers) in the system (see column 2, lines 51-57). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to perform the delaying at any point prior to combining in Vankka and Montojo et al. including performing the delaying at an RF frequency prior to combination as disclosed by Keashly et al. since Keashly et al. states the delaying prevents the signal peaks of

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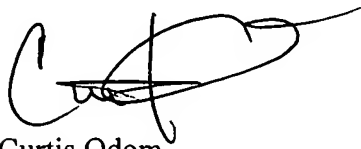
each carrier (channel) from occurring at the same time to reduce peak power (see column 2, lines 27-39) without adversely affecting the average signal power.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Curtis Odom
October 25, 2006

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